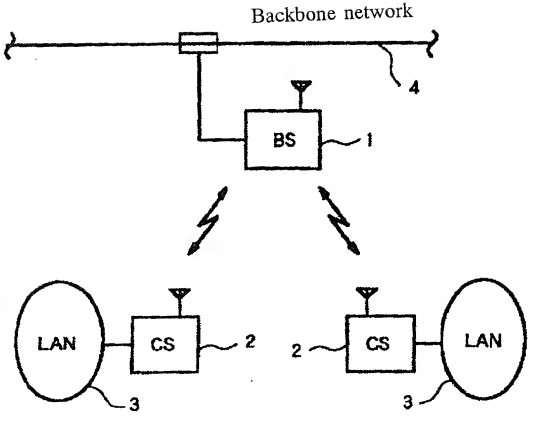


Fig.1

EP 1 523 144 A1 20050413

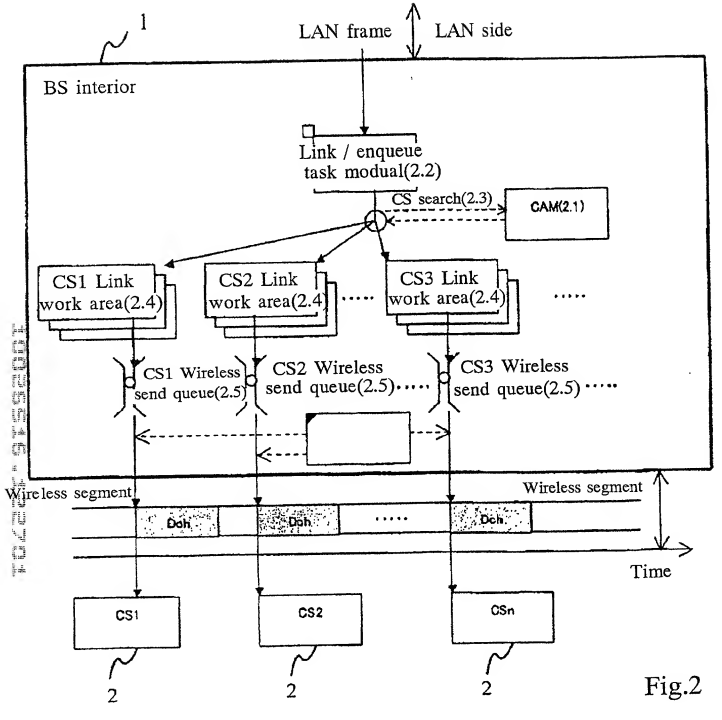

1
LAN frame
LAN side
BS interior
Link / enqueue
task modual(2.2)
CS search(2.3)
CAM(2.1)
CS1 Link
work area(2.4)
CS2 Link
work area(2.4)
CS3 Link
work area(2.4)
CS1 Wireless
send queue(2.5)
CS2 Wireless
send queue(2.5)
CS3 Wireless
send queue(2.5)
Wireless segment
Wireless segment
Dch
Dch
Dch
Time
CS1
CS2
CSn
2
2
2

Fig.2

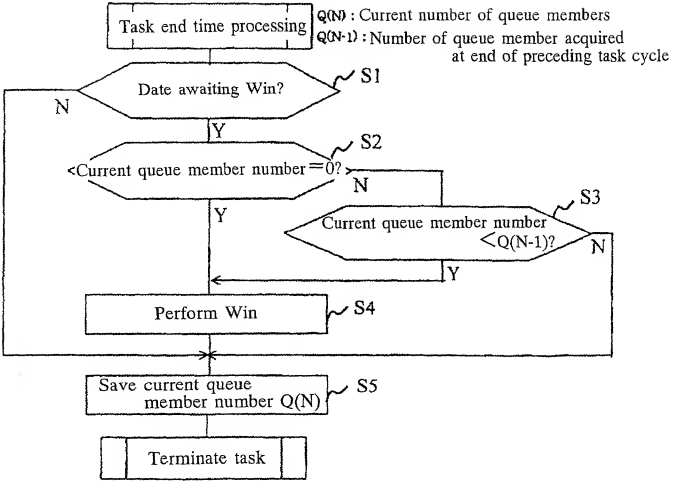

Task end time processing
Q(N) : Current number of queue members
Q(N-1) : Number of queue member acquired at end of preceding task cycle
Date awaiting Win?
S1
N
Y
<Current queue member number =0?
S2
N
Y
Current queue member number <Q(N-1)?
S3
N
Y
Perform Win
S4
Save current queue member number Q(N)
S5
Terminate task

Fig.3

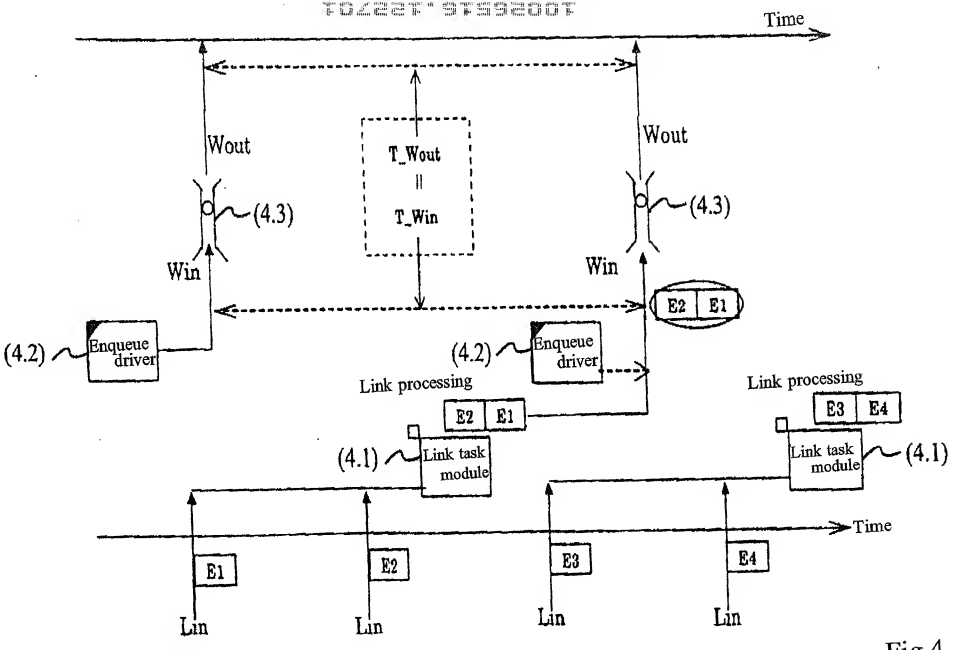

Time
Wout
T_Wout
||
T_Win
Wout
(4.3)
(4.3)
Win
Win
E2
E1
(4.2)
Enqueue driver
(4.2)
Enqueue driver
Link processing
Link processing
E2
E1
E3
E4
(4.1)
Link task module
Link task module
(4.1)
Time
E1
E2
E3
E4
Lin
Lin
Lin
Lin

Fig.4

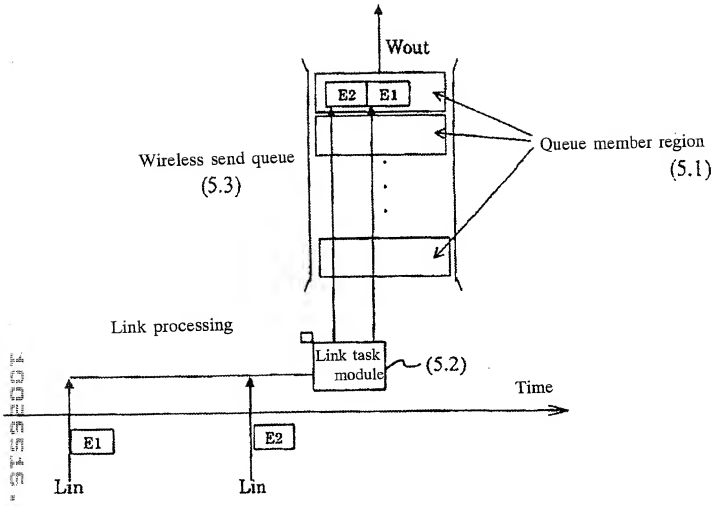

Wout
E2
E1
Queue member region
(5.1)
Wireless send queue
(5.3)
Link processing
Link task module
(5.2)
Time
E1
E2
Lin
Lin

Fig.5

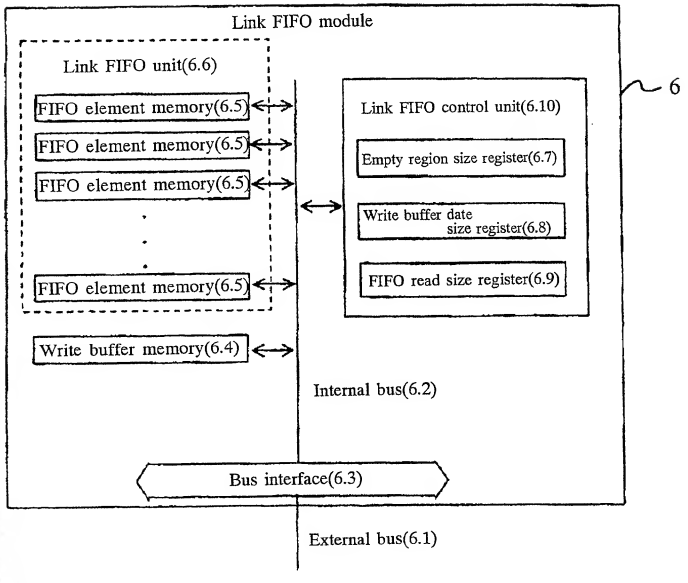

Link FIFO module
Link FIFO unit(6.6)
FIFO element memory(6.5)
FIFO element memory(6.5)
FIFO element memory(6.5)
FIFO element memory(6.5)
Write buffer memory(6.4)
Link FIFO control unit(6.10)
Empty region size register(6.7)
Write buffer date size register(6.8)
FIFO read size register(6.9)
Internal bus(6.2)
Bus interface(6.3)
External bus(6.1)
6

Fig.6

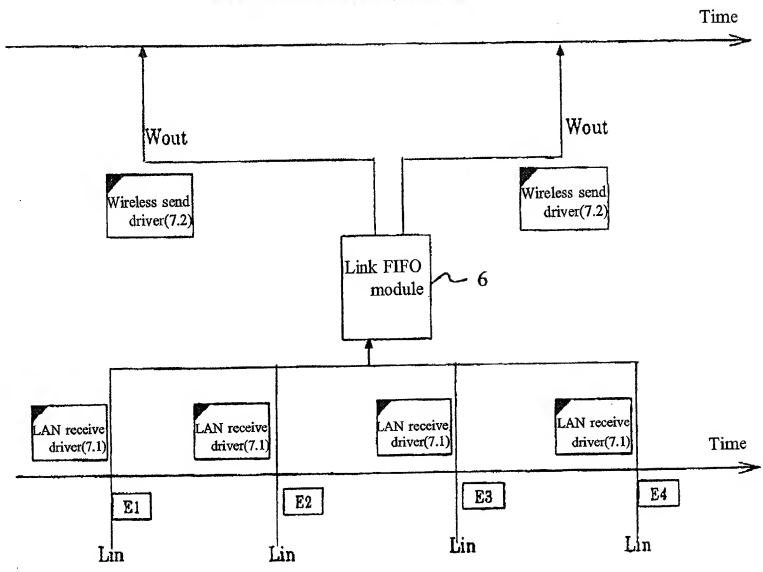

Time
Wout
Wout
Wireless send driver(7.2)
Wireless send driver(7.2)
Link FIFO module
6
LAN receive driver(7.1)
LAN receive driver(7.1)
LAN receive driver(7.1)
LAN receive driver(7.1)
Time
E1
E2
E3
E4
Lin
Lin
Lin
Lin

Fig.7

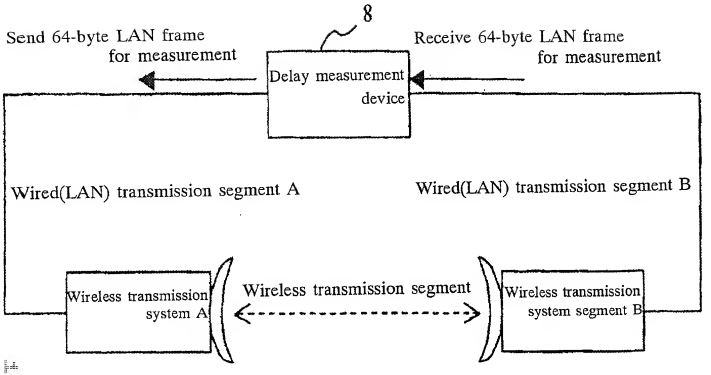

8
Send 64-byte LAN frame for measurement
Receive 64-byte LAN frame for measurement
Delay measurement device
Wired(LAN) transmission segment A
Wired(LAN) transmission segment B
Wireless transmission system A
Wireless transmission segment
Wireless transmission system segment B

Fig.8

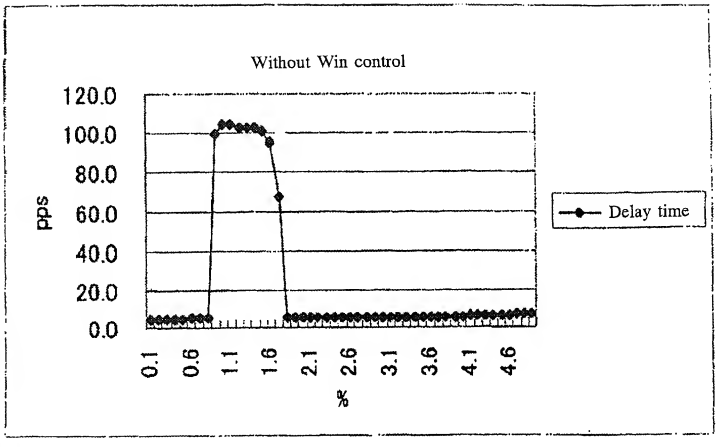

Without Win control
120.0
100.0
80.0
60.0
40.0
20.0
0.0
pps
0.1
0.6
1.1
1.6
2.1
2.6
3.1
3.6
4.1
4.6
Delay time

Fig.9

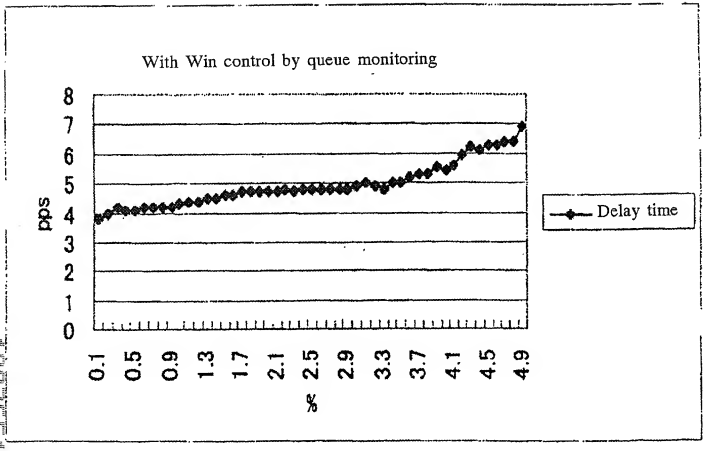
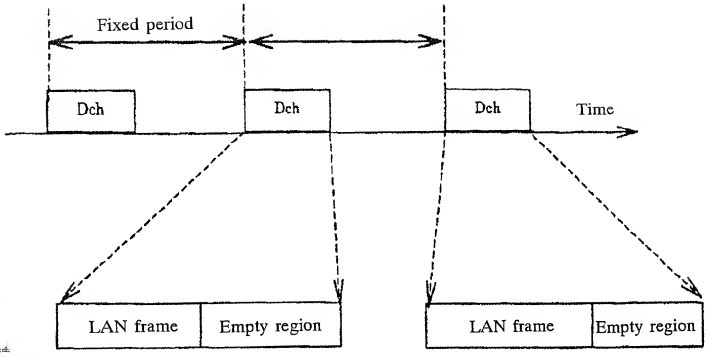

With Win control by queue monitoring
pps
8
7
6
5
4
3
2
1
0
0.1
0.5
0.9
1.3
1.7
2.1
2.5
2.9
3.3
3.7
4.1
4.5
4.9
%
Delay time

Fig.10



※ Since Dch size is fixed and LAN frame size is variable,
an empty region always present in Dch.

Fig.11

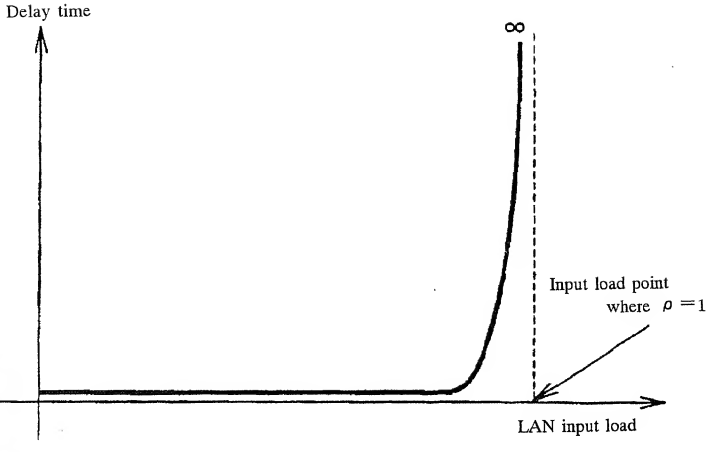


Fig.12

TOZ2ZT' 9T59Z00T

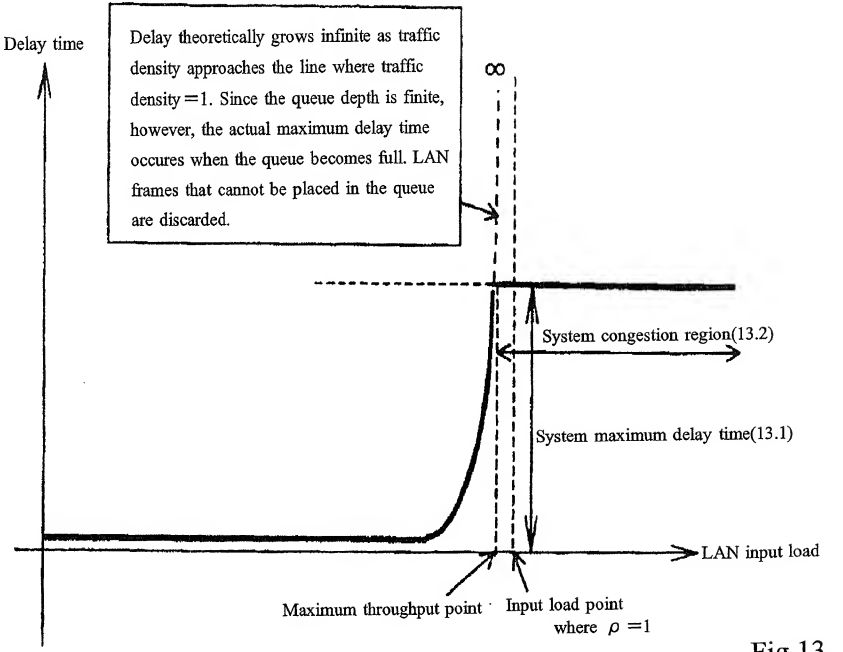


Fig.13

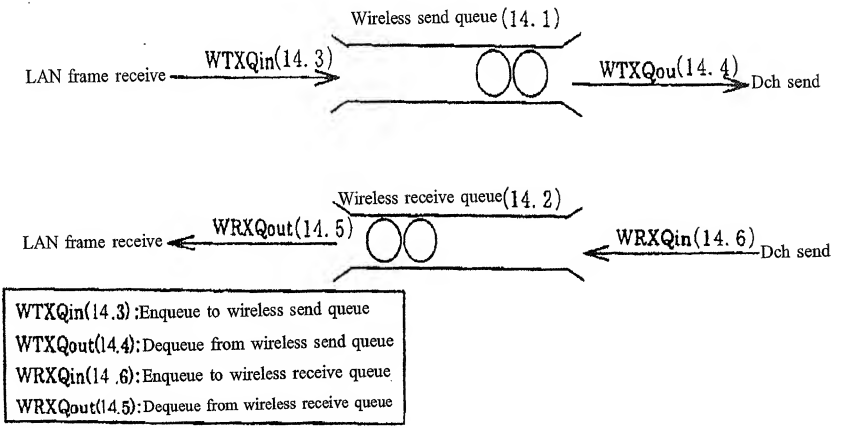

Wireless send queue (14. 1)
LAN frame receive
WTXQin(14. 3)
WTXQou(14. 4)
Dch send
Wireless receive queue(14. 2)
LAN frame receive
WRXQout(14. 5)
WRXQin(14. 6)
Dch send
WTXQin(14.3) :Enqueue to wireless send queue
WTXQout(14.4):Dequeue from wireless send queue
WRXQin(14 .6):Enqueue to wireless receive queue
WRXQout(14.5):Dequeue from wireless receive queue

Fig.14

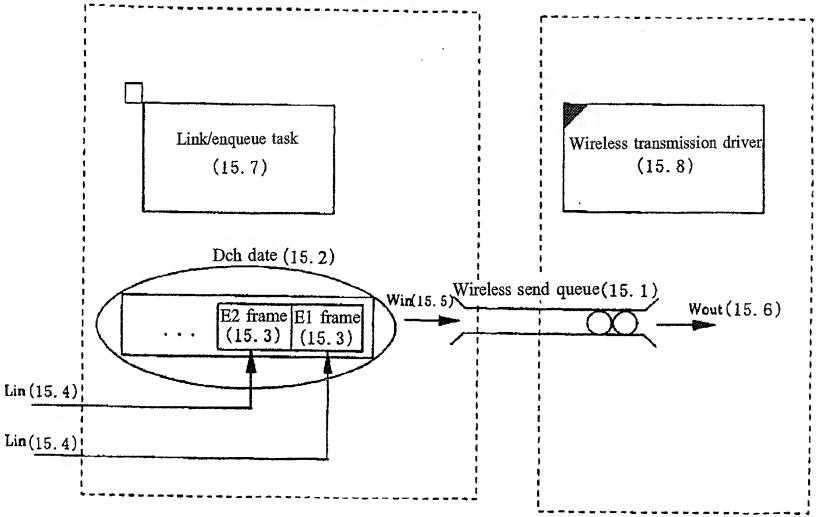

Link/enqueue task
(15. 7)
Wireless transmission driver
(15. 8)
Dch date (15. 2)
E2 frame
(15. 3)
E1 frame
(15. 3)
Win(15. 5)
Wireless send queue(15. 1)
Wout(15. 6)
Lin(15. 4)
Lin(15. 4)

Fig.15

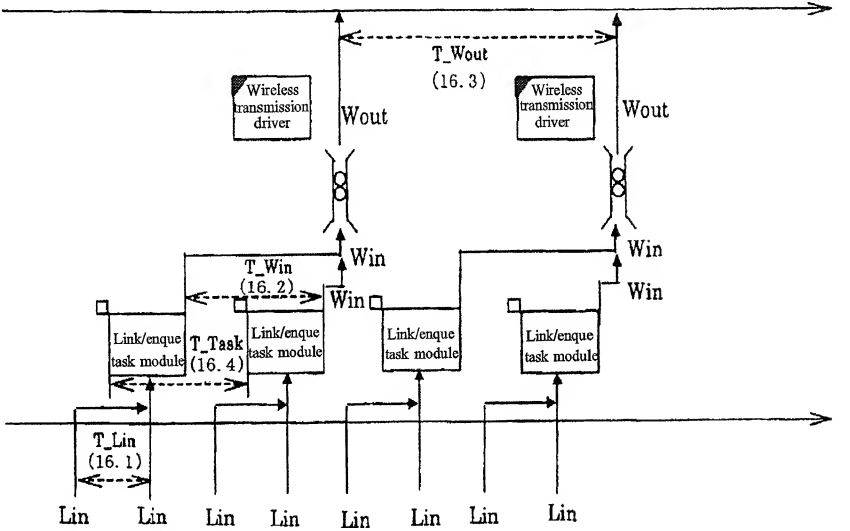

T_Wout
(16.3)
Wireless transmission driver
Wout
Wireless transmission driver
Wout
Win
Win
T_Win
(16.2)
Win
Win
Link/enque task module
T_Task
(16.4)
Link/enque task module
Link/enque task module
Link/enque task module
T_Lin
(16.1)
Lin
Lin
Lin
Lin
Lin
Lin
Lin
Lin

Fig.16

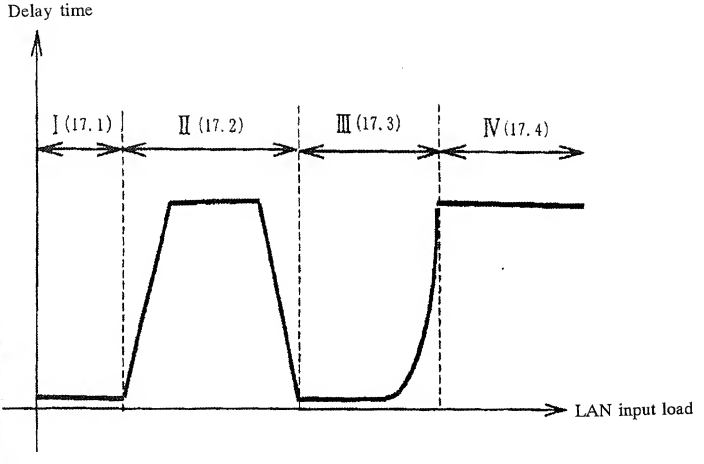


Fig.17

TOZ2ET 'STS9200T

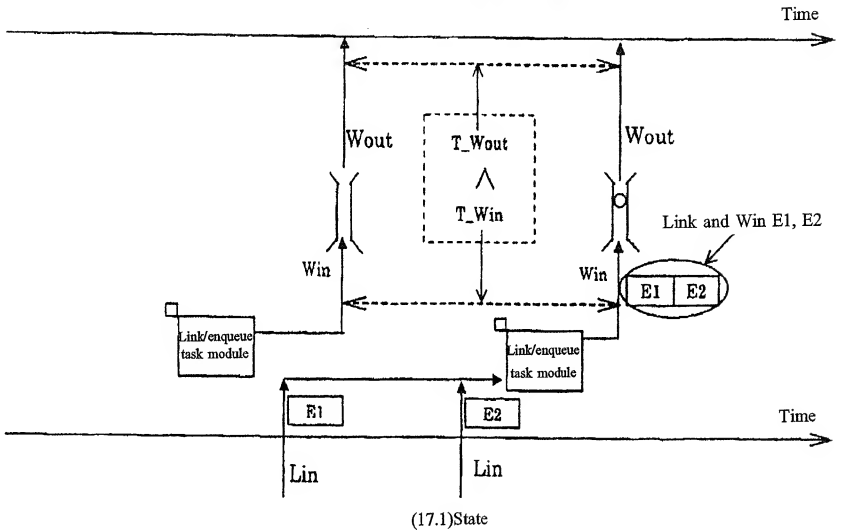
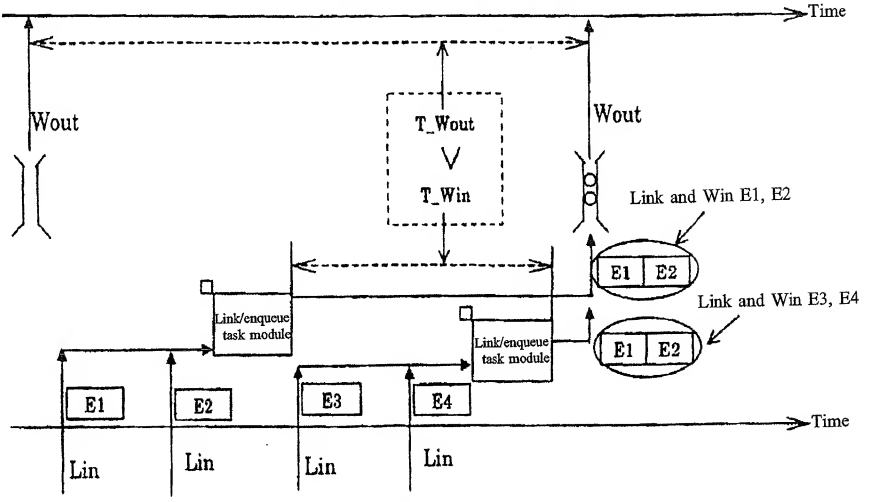
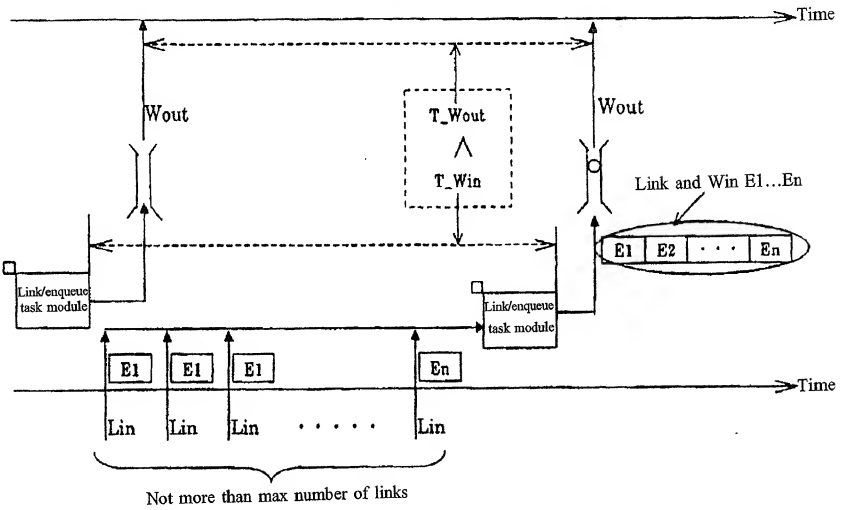


Fig.18



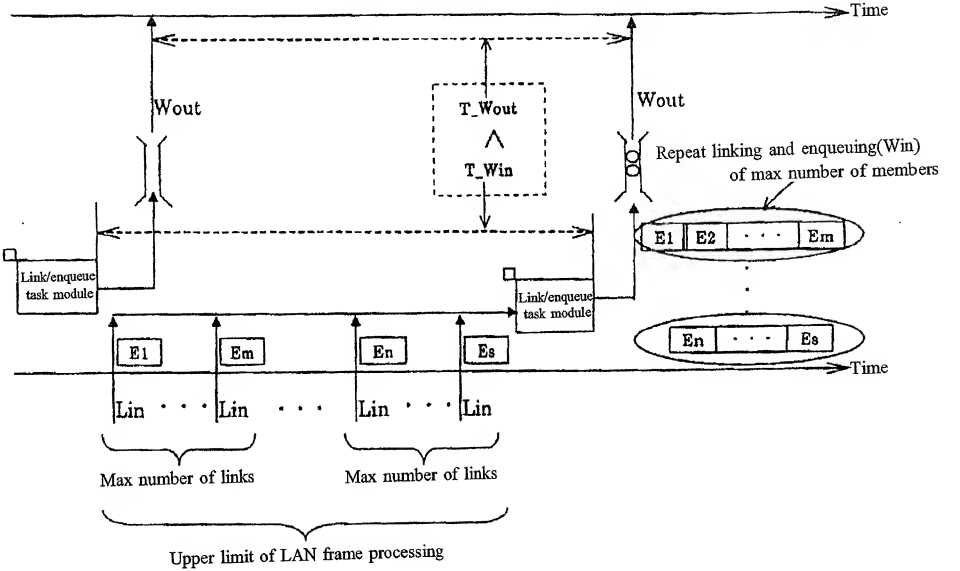
(17.2)State

Fig.19



(17.3) State

Fig.20



(17.4)State

Fig.21

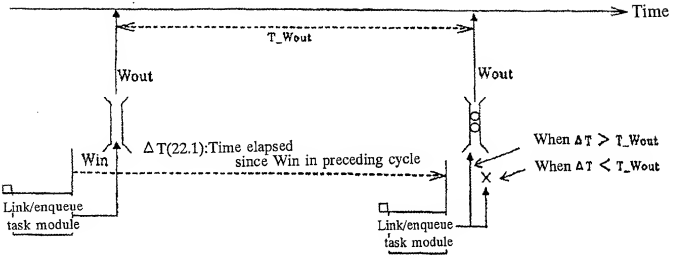

Time
T_Wout
Wout
Wout
Win
ΔT(22.1):Time elapsed
since Win in preceding cycle
When ΔT > T_Wout
When ΔT < T_Wout
X
Link/enqueue
task module
Link/enqueue
task module

Fig.22

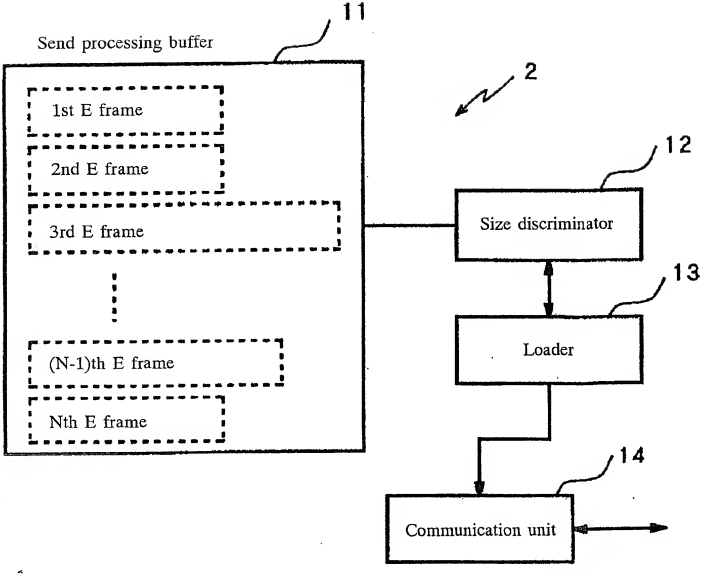

11
Send processing buffer
1st E frame
2nd E frame
3rd E frame
(N-1)th E frame
Nth E frame
2
12
Size discriminator
13
Loader
14
Communication unit

Fig.23

Wireless frame format

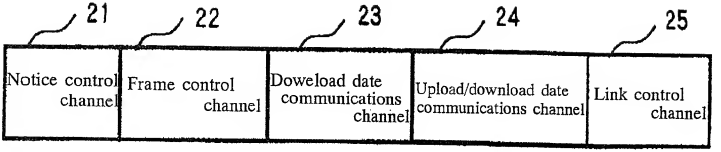


Fig.24

Date communications channel format

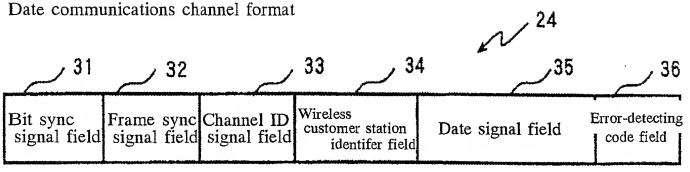


Fig.25

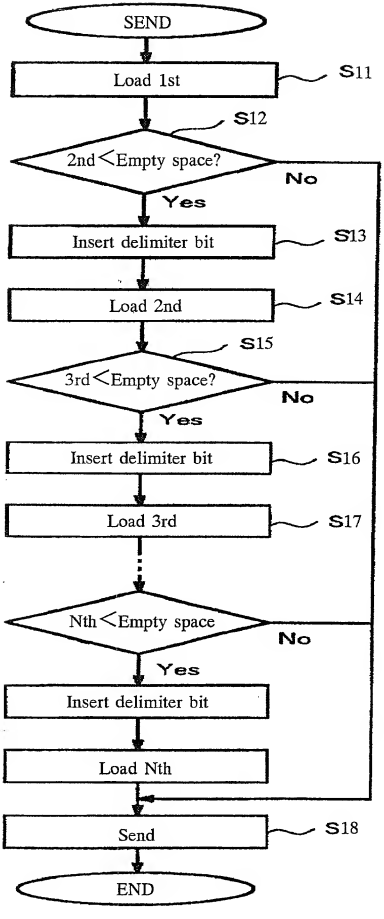

SEND
Load 1st
S11
S12
2nd<Empty space?
No
Yes
Insert delimiter bit
S13
Load 2nd
S14
S15
3rd<Empty space?
No
Yes
Insert delimiter bit
S16
Load 3rd
S17
Nth<Empty space
No
Yes
Insert delimiter bit
Load Nth
Send
S18
END

Fig.26

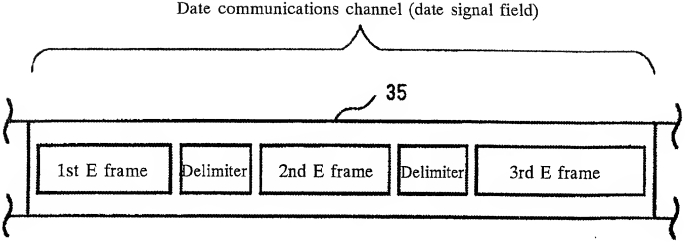

Date communications channel (date signal field)
35
1st E frame
Delimiter
2nd E frame
Delimiter
3rd E frame

Fig.27